

CLAIMS

[cl001] 1. A curing light comprising:

- a wand adapted to be grasped by a human hand for use in positioning and manipulating the curing light,
- an elongate heat sink with a proximal end and a distal end, said proximal end being proximate said wand, said elongate heat sink having a longitudinal axis,
- a mounting platform located at said elongate heat sink distal end, said mounting platform being adapted to have a LED chip module,
- an LED chip module mounted on said mounting platform, said LED chip module including
 - a primary heat sink, said primary heat sink having a smaller mass than said elongate heat sink,
 - a well on said primary heat sink for mounting an LED chip,
 - an LED chip mounted in said well,
 - a cover that provides protective covering for said LED chip and which permits light emitted by said LED chip to pass through it to provide usable light exiting from said light module, and
 - a thermoelectric cooler located on said elongate heat sink, said thermoelectric cooler serving to assist in heat dissipation.

[cl002] 2. A curing light as recited in claim 1 wherein light emitted by said LED chip module is emitted at an angle of from about 30 degrees to about 150 degrees to said elongate heat sink longitudinal axis.

[cl003] 3. A curing light as recited in claim 1 wherein light emitted by said LED chip module is emitted at an angle of about 90 degrees to said elongate heat sink longitudinal axis.

[cl004] 4. A curing light as recited in claim 1 further comprising at least one air vent on said wand.

[cl005] 5. A curing light as recited in claim 1 further comprising a plurality of insulators to insulate said elongate heat sink from said wand.

[cl006] 6. A curing light as recited in claim 1 wherein said wand has a housing and said elongate heat sink is located at least partially within said housing.

[cl007] 7. A curing light as recited in claim 6 further comprising an air space between said elongate heat sink and said wand.

[cl008] 8. A curing light comprising:

a wand adapted to be grasped by a human hand for use in positioning and manipulating the curing light,

an elongate heat sink with a proximal end and a distal end, said proximal end being proximate said wand, said elongate heat sink having a longitudinal axis,

a primary heat sink,

said primary heat sink having a smaller mass than said elongate heat sink,

said primary heat sink being attached to said elongate heat sink,

at least one semiconductor device capable of emitting light useful in curing composite materials directly mounted to said primary heat sink,

a cover that provides protective covering for said chip and which permits light emitted by said chip to pass through it to provide usable light exiting from the cover, and

a thermoelectric cooler located on said elongate heat sink, said thermoelectric cooler serving to assist in heat dissipation.

[cl009] 9. A curing light as recited in claim 8 wherein light emitted by said chip is emitted at an angle of from about 30 degrees to about 150 degrees to said elongate heat sink longitudinal axis.

[cl010] 10. A curing light as recited in claim 8 wherein light emitted by said LED chip module is emitted at an angle of about 90 degrees to said elongate heat sink longitudinal axis.

[cl011] 11. A curing light as recited in claim 8 further comprising a plurality of insulators to insulate said elongate heat sink from said wand.

[cl011] 11. A curing light as recited in claim 8 wherein said wand has a housing and said elongate heat sink is located at least partially within said housing.

[cl012] 12. A curing light as recited in claim 11 further comprising an air space between said elongate heat sink and said wand.

[cl013] 13. A curing light as recited in claim 12 further comprising at least one air vent on said wand.

[cl014] 14. A curing light as recited in claim 8 wherein said chip is selected from the group consisting of light emitting diode chips, laser chips, light emitting diode chip array, diode laser chips, diode laser chip array, surface emitting laser chips, edge emitting laser chips, and VCSEL chips.

[cl015] 15. A curing light as recited in claim 8 wherein said cover is selected from the group consisting of windows and focus lenses.

[cl016] 16. A curing light comprising:

a wand adapted to be grasped by a human hand for use in positioning and manipulating the curing light,

a wand housing that forms at least a portion of the outer surface of said wand, controls located on said wand housing for controlling initiation and termination of light emission from the curing light,

a heat sink, said heat sink serving to assist in heat dissipation, and said heat sink located in said wand housing,

a plurality of insulators useful for insulating said heat sink from said housing, air space between said heat sink and said housing, at least one vent located on said housing,

at least one semiconductor device capable of emitting light useful in curing composite materials, and

a thermoelectric cooler in physical contact with said heat sink, said thermoelectric cooler serving to assist in heat dissipation;

wherein light emitted by said chip is emitted at an angle of from about 30 degrees to about 150 degrees to said elongate heat sink longitudinal axis; and

wherein said chip is selected from the group consisting of light emitting diode chips, laser chips, light emitting diode chip array, diode laser chips, diode laser chip array, surface emitting laser chips, edge emitting laser chips, and VCSEL chips.